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ABSTRACTS OF PATENTS
of the
Northern Regional Research Laboratory
Peoria, Illinois

January - December 1951

These patents are assigned to the Secretary of Agriculture. Copies of patents may be purchased from the U. S. Patent Office, Washington, D. C.

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BETA-CYANOETHYL DERIVATIVES OF AMINO ACIDS AND PROCESS FOR PREPARING THEM

Leonard L. McKinney, John C. Cowan, and Eugene H. Uhing.
U. S. Patent 2,538,024. January 16, 1951.

A salt of alpha-amino acid is reacted in aqueous solution with either one of two molecular equivalents of acrylonitrile. The reaction mixture is acidified after the reaction is completed. The products, being beta-cyanoethyl substituted amino acids, may be separated from the reaction mixture.

PHENOLIC MOLDING RESINS

Thomas F. Clark.
U. S. Patent 2,545,446. March 20, 1951.

Saccharification lignin is mixed with cresylic acid, and the mixture heated with phenol and formaldehyde to give a molten thermosetting plastic molding material. The material is washed and comminuted, mixed with finely divided agricultural residue powder and a small amount of hexamethylenetetramine, and the mixture compounded by milling and heat. The products possess a high flexural strength and low water absorption.

SEPARATION AND FRACTIONATION OF SUGARS

Edna M. Montgomery and Francis B. Weakley.
U. S. Patent 2,549,840. April 24, 1951.

A purified solution of glucose is obtained from an aqueous solution of glucose and polysacchsrides by adsorbing the polysaccharides upon activated carbon. The polysaccharides are recovered from the carbon by treatment with aqueous phenol, acetic acid, or ephedrine.

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[1] Previous lists of Northern Regional Research Laboratory patents were issued as AIC 230 and its supplements 1 and 2.

COATING COMPOSITIONS

Lee Bert Falkenburg, Arthur J. Lewis and John C. Cowan.
U. S. Patent 2,550,682. May 1, 1951.

A basic polyamide having an amine equivalent of 1500 to 2000, formed by reacting polymeric fat acids or esters thereof with an excess of ethylene diamine, is dissolved in alcohol, giving a highly durable film-forming composition for application to metals.

COATING COMPOSITIONS FROM SOYBEAN OILS

Arthur J. Lewis, Helen A. Moser and John C. Cowan.
U. S. Patent 2,550,703. May 1, 1951.

A minor amount of calcium oxide is added to soybean oil paints containing pigments, such as basic carbonate of white lead, cryptone, or titanox B-30, to reduce the residual tack, and also improve color retention and durability.

ENZYME PRODUCTION

Julian Corman.
U. S. Patent 2,557,078. June 19, 1951.

A fungal enzyme preparation which may be used to convert starch to high-quality sugar products is prepared by culturing an enzyme-producing fungus in a sterile synthetic medium containing a protein-free source of nitrogen. The absence of protein material in the medium leads to improved taste when these enzymes are used to convert starch to syrups.

HALOGENATED UNSATURATED HIGHER FATTY ACIDS AND DERIVATIVES

Howard M. Teeter and John C. Cowan.
U. S. Patent 2,557,159. June 19, 1951.

Substantial halogenation of unsaturated higher fatty acids and their derivatives is accomplished by reaction with alkyl hypohalites. The resulting products contain conjugated olefinic linkages. For example, alkali-refined soybean oil is treated with tertiary butyl hypochlorite to produce a product containing 9.92 percent chlorine and a total conjugation of 20.7 percent.

PRODUCTION OF FURFURAL FROM PENTOSE LIQUORS

John W. Dunning, Charles F. Frye and Elbert C. Lathrop.
U. S. Patent 2,559,607. July 10, 1951.

Furfural is produced by converting pentose-containing liquors by treatment with acids. Yields are improved by maintaining the concentration of furfural in the reaction medium below 0.7 percent. This may be accomplished by continuously removing the solution from the conversion zone, cooling the solution, and then extracting with a furfural solvent. After extraction, the solution is recycled to the conversion.

PREPARATION OF D-TARTARIC ACID

Lewis B. Lockwood and George E. N. Nelson.
U. S. Patent 2,559,650. July 10, 1951.

D-Tartaric acid is produced by fermentation of a soluble salt of 5-keto-D-gluconic with *Pseudomonas fluorescens*. The fermentation is conducted under submerged aerobic conditions for a period of 3 to 17 days, and the tartaric acid is recovered as potassium hydrogen tartrate.

PREPARATION OF D-GLUCURONIC ACID

Charles L. Mehltretter.
U. S. Patent 2,559,652. July 10, 1951.

D-Glucuronic acid is made by treating a solution of calcium 1,2-acetone-D-glucuronate hydrate with oxalic acid and heating the resulting solution above 75° C. for 1 to 3 hours. The precipitated calcium oxalate is removed by filtration. D-glucuronic acid is recovered from the filtrate.

REVERSIBLE VEGETABLE GEL

Arthur C. Beckel and Paul A. Belter.
U. S. Patent 2,561,333. July 24, 1951.

A novel vegetable gel is made by mixing alcohol with a proteinaceous soybean fraction dispersed in water. Sufficient alcohol is added to result in a solution containing 30 to 50 percent alcohol by volume. This solution, after heating to a temperature between 75° C. and boiling, forms a reversible gel when cooled to 30° C. or lower. The reversible gel finds use as a food material. The proteinaceous fraction used as a starting material is obtained by extracting an alcohol-extracted soybean residue with water.

METHOD FOR PRODUCING VITAMIN B_{12}

Harlow H. Hall and Henry M. Tsuchiya.
U. S. Patent 2,561,364. July 24, 1951.

Vitamin B_{12} is produced by cultivating *Flavobacterium devorans* in a medium containing an assimilable carbon source such as dextrose or crude molasses and an assimilable nitrogen source such as corn steep liquor or soy meal. The product may be recovered as a vitamin concentrate by evaporating the culture liquor after fermentation is complete.

N-BETA-PROPIONIC ACID DERIVATIVES OF ALPHA-AMINO ACIDS

Leonard L. McKinney, Eugene H. Uhing, Eugene A. Setzkorn and John C. Cowan.
U. S. Patent 2,562,198. July 31, 1951.

Beta cyanoethyl derivatives of amino acids, produced by the reaction of alpha amino acid salts with acrylonitrile, are hydrolyzed by acids or alkalies (alkali hydrolysis preferred) to form the N-beta-propionic acid derivatives. The products are white, crystalline solids useful as organic intermediates.

PROCESS FOR MAKING D-GLUCURONIC ACID AND ITS SALTS

Charles L. Mehltretter.
U. S. Patent 2,562,200. July 31, 1951.

α-Methyl-D-glucoside is catalytically oxidized with an oxygen-containing gas to form alpha-methyl-D-glucuronoside. The glucuronoside is then hydrolyzed with acid, neutralized, and treated with aniline to precipitate aniline N-D-glucuronoside salt. The salt is then hydrolyzed to give the D-glucuronic acid.

STARCH CARBAMATES

Ivan A. Wolff.
U. S. Patent 2,562,978. August 7, 1951.

Starch is reacted with an organic isocyanate, under substantially anhydrous conditions, in an organic solvent to produce a starch carbamate containing at least 1 carbamyl group for every 14 anhydroglucose units. The product is nonswelling or nonpaste forming in hot water.

DRYING WET WHEAT GLUTEN

Justin M. Tuomy and Richard L. Slotter.
U. S. Patent 2,567,980. September 18, 1951.

Wet wheat gluten, as produced by the batter process, and having a moisture content of 65 to 70 percent, is slurried with ethanol by agitation, and the slurry is dried upon a heated surface. The drying is conducted by allowing the slurry to remain for about 10 seconds or less in contact with a surface heated to 150° to 170° C.

POLYMYXIN PRODUCTION

Robert G. Benedict.
U. S. Patent 2,571,104. October 16, 1951.

The antibiotic, polymyxin, is produced by cultivating *Bacillus polymyxa* under submerged aerobic conditions in a medium containing 1 to 2 percent carbon source (glucose) and a source of assimilable nitrogen (peanut flour). The medium is supplemented during the course of the fermentation by adding .5 to 2 percent carbon source. The ultraviolet mutant, *B. polymyxa* NRRL B-719 (u.v. -37), gives high yields of the antibiotic. Maintaining the carbon source level at the low values mentioned tends to suppress the formation of unwanted byproducts and to increase the yield of polymyxin.

PHOSPHATES OF AMYLACEOUS POLYSACCHARIDES

Rolland L. Lohmar, Jr.
U. S. Patent 2,575,352. November 20, 1951.

Phosphorylated starch, insoluble in aqueous media, either neutral or within weakly acidic or weakly basic ranges, is prepared by phosphorylation of starch with a phosphorous oxyhalide in a pyridine medium. The starch is activsted by pretreatment in pyridine. When granular starch is used, the phosphorylated product retains its granule form.

BIOLOGICAL PRODUCTION OF RIBOFLAVIN

Thomas G. Pridham.
U. S. Patent 2,578,738. December 18, 1951.

Riboflavin is produced by culturing *Ashbya gossypii* in a carbohydrate (glucose)-assimilable nitrogen medium by the general method of U. S. Patent No. 2,445,128. The yield is increased by adding an increment of the carbohydrate during the course of the fermentation. The time of addition is during minimum pH after riboflavin synthesis has begun and the carbohydrate has fallen to 0.10 to 0.20 percent of the medium.